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# PUBLIC HEALTH REPORTS

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## CERTAIN MILITARY ASPECTS OF HOOKWORM DISEASE.

By CH. WARDELL STILES, Professor of Zoology, United States Public Health Service.

A newly formed militia unit, recently mobilized for war service, was quartered temporarily at a Government reservation where the writer was conducting some experiments. Within less than two days after reaching their quarters one of the recruits was suspected of trying to shirk his duty and the commanding officer planned to place him in confinement for discipline. The man claimed that he was not feeling well, and the lieutenant, as a matter of justice to the recruit and of protection to himself, requested me to pass upon the case medically. The diagnosis of light hookworm infection was made upon the basis of symptoms and was immediately confirmed microscopically. Treatment was instituted, and the patient promptly gained about 8 pounds in weight.

On the third day after reaching quarters a second recruit was brought for examination. He had stood guard the night before, was unable to sleep later, and complained that without sleep he was unable to drill. He gave a history of insomnia, for which he had been under treatment that had not given satisfactory results. The writer again diagnosed light hookworm infection from general symptoms and confirmed the diagnosis microscopically. After treatment this man recovered completely from his insomnia, changed remarkably in appearance and disposition, and became one of the leading spirits in the unit.

A tentative diagnosis of hookworm infection was then made of ten or more other men from their general appearance, as noticed on the most casual observation, and specimens were collected for microscopic examination.

In a total of 75 militia recruits recently examined by the writer at a Government reservation, 47 men (63 per cent) showed hookworm infection, 3 *Ascaris lumbricoides*, 1 *Hymenolepis nana*, and 1 a heavy infection with *Strongyloides*;<sup>1</sup> two recruits had double infections; 25 examinations were negative.

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<sup>1</sup> Recommendation was made that the recruit (who was in the galley) with the *Strongyloides* infection be discharged, on the grounds that: (a) No satisfactory treatment is known for this condition and (b) the risks of an early breakdown and resulting pension were so great as not to be justified.

Treatment of the infected men was instituted, and although the writer left the reservation for another station before this was completed, the physical improvement and the gain in weight and efficiency among the recruits were so marked as to produce comment even from the nonmedical men.

One of the hookworm patients was an ex-cadet from West Point, who had been "found" by a very narrow margin in his midyear examinations. Theoretically his infection was ample to account for his failure and the financial loss incurred thereby by the Government.

The foregoing experience has its lessons in the present war conditions, and the following important points in particular should be noticed:

(1) These recruits represent an unselected instance of what may be expected in certain portions of the country among average enlistments.

(2) Two volunteers were rejected because of remediable conditions clearly due to hookworm infection, and these men represent instances of a very large number of cases that will probably soon be noticed in many counties in both the Gulf-Atlantic and the southern Pacific regions.

(3) Several recruits were rejected because of underweight, and in the forthcoming selective draft there will undoubtedly be hundreds of similar cases. If the regulations permit, numerous cases of this type might justifiably be accepted provisionally, subject to the results of treatment as respects probable increase in weight.

(4) A failure to treat the hookworm cases and to eliminate at least the severe infections of *Strongyloides* will undoubtedly result in unjust and preventable punishment for offenses due to remediable conditions, considerable physical and mental inefficiency, an unnecessarily high daily "sick call," and premature and preventable pensions.

(5) If even light cases of infection with hookworms are sent to the trenches in Europe the danger is present of causing a widespread epidemic similar to the St. Gothard Tunnel epidemic, or even to the Andersonville stockade epidemic.

(6) The danger is also present that our military forces may cause a widespread infection in France and Belgium that it will take years of work and large expenditures of money to control and eradicate after the war.

(7) The dangers referred to (inefficiency, sickness, epidemics, etc.) can be prevented to a very great extent if all the recruits (or at least those from certain States) are systematically examined for intestinal parasites and either treated in the American training camps or discharged, as necessity indicates.

(8) The examination can best be a "3-slide" ("10-cover glass") test, preferably by the centrifuge method. If an examination for hookworms only is made the work will be materially lessened.

(9) This examination could be made more economically, more efficiently, and more rapidly at a central laboratory than at the separate concentration camps. The specimens could be collected at the camps and sent by parcel post, under proper precautions, to the central laboratory. This plan is evidently not free from objection from certain administrative points of view, but if adopted it would save the duplication of equipment and unnecessary training of many assistants and it would make for uniform examination.

10. As a preliminary and tentative estimate, subject to revision if necessary, it may be said that the examinations suggested would cost somewhere between 20 cents (possibly 15 cents) and 30 cents (possibly 40 cents) each. Certain factors in the expense can not, however, be definitely foreseen at present.

11. The writer's experience indicates that girls are better for this work than men, but existing circumstances make it more feasible to train men enlisted in the hospital corps to make the examinations. It takes about 1 to 3 weeks to train a person to be trustworthy in the examination. The best results are obtained if the microscopist does not have to work more than half a day at a time.

12. It would be wise to begin promptly with all units at present organized.

13. While the hookworm and *Strongyloides* examinations are the most important ones involved, the other parasites should be considered. Accordingly, the examination of recruits from the warmer portions of the country is at present more pressing than the examination of men from colder localities. The question of extending the inspection to all recruits is, however, an important one to be considered and it would be wise to extend it if time permit.

14. It seems highly probable that, even leaving out of consideration the money value of increased efficiency, the entire expenditure involved in the examination would be saved in the reduced pension roll.

15. It would be well to consider the question whether it would not be wise to combine the examination with a newspaper campaign to induce prospective recruits to take the initiative to have themselves examined and treated.

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## MALARIA IN EASTERN TEXAS.

### PREVALENCE AND GEOGRAPHIC DISTRIBUTION.

The periodical circularization of the physicians of eastern Texas to determine the prevalence and geographic distribution of malarial infection in the eastern part of the State was carried on during the last nine months of 1915, and the first, second, and fourth quarters of